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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/643,653	08/19/2003	Joshua D. Posamentier	42.P16446X	5253

7590 01/11/2007

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EXAMINER	
VAN ROY, TOD THOMAS	
ART UNIT	**PAPER NUMBER**
2828	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/11/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/643,653	POSAMENTIER, JOSHUA D.	
	Examiner	Art Unit	
	Tod T. Van Roy	2828	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 October 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *21 November 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Priority

The examiner notes that if the applicant wishes to obtain the older CIP date they must file a petition to correct the date in question. Please see the "Response to Request for Corrected filing Receipt" document mailed 04/07/2004.

Response to Amendment

The examiner acknowledges the amending of claims 1, 8, 14 and 17.

Claim Objections

Claim 17 is accepted.

Response to Arguments

Applicant's arguments with respect to claims 1-20 have been considered but are moot in view of the new ground(s) of rejection.

Applicant's arguments filed 10/16/2006 have been fully considered but they are not persuasive.

With respect to claims 8-9 and 11:

The applicant has stated that the combination of Fukushima with Hirano is not valid due to Fukushima teaching a linear relationship with respect to output light to a photodiode while Hirano teaches a non-linear output light to fiber relationship.

The examiner does not dispute the difference between the stated relationships, but believes that the combination of the references is valid since the differences in

output coupling are being demonstrated between non-similar optical components. Coupling between a photodiode and laser diode will inherently differ from that of coupling between a fiber and laser diode due to the difference in material types between the photodiode and the fiber. As the materials differ, their reactions to varying temperature will therefor differ accordingly, accounting for the differences between the teachings of Fukushima and Hirano. Since these two references were combined to account for Fukushima's lack of fiber or fiber tracking use, it appears as though the combination is valid, as each reference is teaching coupling properties of two different optical elements, rather than opposing views of coupling between similar elements. For these reasons it is believed that the combination of Fukushima with Hirano would be considered reasonable to one of ordinary skill in the art.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-4 are rejected under 35 U.S.C. 102(e) as being anticipated by Hongo et al. (US 2004/0028099).

With respect to claim 1, Hongo discloses a method, comprising: adjusting an amount of light coupled into an optical fiber by: converting an optical beam emitted from

a laser to a current proportional to a power of the optical beam using a monitor photodiode ([0035] lines 10-12); adjusting the current from the monitor photodiode up or down using a thermistor and resistor network ([0038] lines 2-10) in response to a change in temperature affecting the optical fiber different from the laser (inherent, the materials of the laser and fiber differ, therefor the temperature change would affect each differently), and adjusting the power of the optical beam emitted from the laser (([0038] lines 1-2).

With respect to claims 2 and 4, Hongo discloses the method outlined in the rejection to claim 1 and further discloses the optical beam to be emitted from the back facet and that a constant ratio of power between the front and back facets be maintained ([0038] lines 16-20), and the output from the front facet of the laser be coupled into an optical fiber ([0036] lines 18-22).

With respect to claim 3, Hongo discloses the method outlined in the rejection to claim 1 and further discloses applying the processed currents to the laser to adjust the power of the optical beam emitted from the front facet ([0035] lines 7-10, abs. 11-14).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 5-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hongo in view of Gilliland et al. (US 5812582).

With respect to claim 5, Hongo teaches the method as outlined in the rejection to claim 1 above, but does not teach coupling the optical beam to the photodiode using lens backscatter. Gilliland teaches a vertical cavity surface emitting laser (VCSEL) system using a feedback method wherein backscatter is used to provide the optical signal to the monitor photodiode (col.7 lines 35-41). It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the method of Hongo with the backscatter signal of Gilliland in order to allow for flexibility in the system design, namely, allowing for alternative components to be placed near to the back or bottom facet of the laser diode device.

With respect to claim 6, Hongo and Gilliland teach the method as outlined in the rejection to claim 5, and further teach applying the processed currents to adjust the power emitted from the top facet of the laser (Hongo, abs. lines 11-14; Gilliland, fig.1 where top facet is only output of device).

With respect to claim 7, Hongo and Gilliland teach the method as outlined in the rejection to claim 6, and further teach a constant ratio of power between the output facet and that monitored by the photodiode be maintained ([0038] lines 16-20), and the output from the front facet of the laser be coupled into an optical fiber ([0036] lines 18-22).

Claims 14-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jones et al. (US 6621621) in view of Hongo.

With respect to claims 14-16, Jones teaches a system (fig.1) comprising a transponder (col.7 lines 2-6), an EDFA coupled to the transponder (col.18-21), a multiplexer coupled to the EDFA (fig.1 #D), and an additional add-drop multiplexer coupled to the EDFA (fig.2a OADM-right side). Jones does not teach using a laser to emit light, a photodiode coupled to receive light from the laser and to convert the light to a current, first circuitry coupled to receive the current and to adjust the current as temperature current and to changes. Hongo teaches using a laser to emit an optical beam (fig.3 #2); a photodiode coupled to receive the optical beam from the laser and to convert the optical beam to a current (fig.3 #4); first circuitry coupled to receive the current and to adjust the current as temperature changes (fig.3 #14,coupled through resistor R2 and thermistor #5, inherently affecting the fiber and the laser differently as the materials of the laser and fiber differ, therefor the temperature change would affect each differently), and to compensate for changes in optical fiber tracking. It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the system of Jones with the apparatus of Hongo in order to utilize the coherent optical

signal of the laser as a transmitter and further to utilize the feedback system without needing to control the emitter temperature (Hongo, abs. lines 4-5).

Claims 8-9 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fukushima (US 4876442) in view of Hirano (US 5519720).

With respect to claim 8, Fukushima teaches a laser to emit an optical beam (fig.1 #3), a photodiode coupled to receive the optical beam from the laser (fig.1 #4) and to convert the optical beam to a current (col.1 lines 62-63); circuitry coupled to receive the current from the photodiode (fig.1 #5), the circuitry to adjust an amount of light output by the diode in response to a change in temperature (due to the thermistor), the circuitry including: a first resistor (fig.1 #52) having a first terminal and a second terminal, the first terminal coupled to receive the current from the photodiode; a thermistor (fig.1 #50) having a first terminal coupled to the first terminal of the first resistor and a second terminal coupled to the second terminal of the first resistor (through ground); and a second resistor (fig.1 #51) having a first terminal and a second terminal, the first terminal coupled to the second terminal of the first resistor (through ground) and the second terminal of the thermistor, wherein current through the thermistor is to adjust in response to a change in temperature. Fukushima does not teach the use of an optical fiber, or to adjust for changes in the tracking. Fukushima also does not teach the use of a third resistor (which would be in parallel to the 1st resistor to have the desired terminal locations). Hirano teaches a semiconductor laser device which uses a fiber (which would inherently be affected differently by a temperature change when compared with

the laser diode due to the differing materials), and adjusts for tracking problems (col.4 lines 43-67). It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the laser emitter of Fukushima with the fiber of Hirano in order to facilitate the transfer of information, as well as to adjust for tracking errors as is done by Hirano in order to couple the maximum amount of light possible into the fiber for optimal transmission. It would also be obvious to add a third resistor in parallel with the first resistor (accounting for the given terminal locations) as it is well known in the art that a resistance value can be split between two resistors in parallel or vice versa.

With respect to claims 9 and 11, Fukushima further teaches the first circuitry to comprise a resistor (fig.1 #52) having a first node ("top" of device) and a second node, and a thermistor (fig.1 #50, negative temp coefficient col.3 line 66) having a first node ("top" of device) and a second node, wherein the first node of the resistor and the first node of the thermistor are coupled to receive the current from the photodiode (converting from I to V).

Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fukushima in view of Hirano and further in view of Queniat et al. (US 5383208).

With respect to claim 10, Fukushima and Hirano teach the apparatus as outlined in the rejection to claim 9 above, including the second circuitry having a current gain device (Fukushima, fig.1 #61 op amp) having a first and second input, where a second input is coupled to the thermistor network. Fukushima and Hirano do not teach the first input of the gain device to be coupled to a digital to analog converter. Queniat teaches a

device for controlling laser diodes wherein a digital to analog converter is used (Queniat, fig.6 #161). It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the current gain device input of Fukushima and Hirano with the digital to analog converter of Queniat in order to allow for the input of a control signal from a digital controller (Queniat, col.4 lines 57-65) in place of a fixed reference voltage based on Fukushima's fig.1 Vref value.

Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fukushima in view of Hirano and further in view of Queniat and Ouchi et al. (US 6055251).

With respect to claim 12, Fukushima, Hirano, and Queniat teach the laser apparatus as outlined in the rejection to claim 10, including the diode laser to be un-cooled (no cooling taught by Fukushima), but do not specify the semiconductor laser to be a distributed feedback laser. Ouchi teaches a semiconductor laser feedback system wherein a distributed feedback laser is used (col.7 lines 40-45). It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the laser apparatus of Fukushima, Hirano and Queniat with the distributed feedback laser of Ouchi in order to obtain a single mode (Ouchi, col.1 lines 31-34) to allow for proper coupling to a fiber waveguide.

Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fukushima in view of Hirano and further in view of Queniat and Gilliland.

With respect to claim 13, Fukushima, Hirano and Queniat teach the laser apparatus as outlined in the rejection to claim 10, including the diode laser to be un-cooled (no cooling taught by Fukushima), but do not specify the semiconductor laser to be a VCSEL. Gilliland teaches a vertical cavity surface emitting laser (VCSEL) system using a feedback apparatus. It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the laser apparatus of Fukushima, Hirano and Queniat with the VCSEL of Gilliland in order to allow for easier coupling to fiber optic waveguides due to the VCSEL's low beam divergence.

Claims 17-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fukushima in view of Hirano and Queniat and Killian (US 6327277).

With respect to claims 17 and 20, Fukushima teaches a laser to emit an optical beam (fig.1 #3), the laser having at least one input and at least one output, a photodiode (fig.1 #4) having an input coupled to one output of the laser, the photodiode to convert the optical beam to a current (col.1 lines 62-63), a resistor (fig.1 #52) having a first node (top of device) coupled to a second node of the photodiode (bottom of the device), a thermistor (fig.1 #50) having a first node (top of device) coupled to the first node of the resistor and the second node of the photodiode, and a current gain device (fig.1 #76, BJT) having an input coupled to an output of the op-amp (fig.1 #61). Fukushima does not teach the use of a digital to analog converter having an output coupled to the current gain device, or an integrator having an input coupled to the thermistor and resistor as well as an output coupled to the digital to analog converter.

Fukushima also does not teach the use of an optical fiber. Hirano teaches a semiconductor laser device which uses a fiber, and adjusts for tracking problems (col.4 lines 43-67). Queniat teaches a device for controlling laser diodes wherein a digital to analog converter is used (Queniat, fig.6 #161). Killian teaches the use of an integrator in a temperature compensation system (fig.5). It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the laser emitter of Fukushima with the fiber of Hirano in order to facilitate the transfer of information, as well as to adjust for tracking errors as is done by Hirano in order to couple the maximum amount of light possible into the fiber for optimal transmission (amount of light coupled will vary as the photodiode feedback increases the driving current, inherently affecting the fiber and the laser differently as the materials of the laser and fiber differ, therefor the temperature change would affect each differently), as well as to combine the op-amp input of Fukushima with the digital to analog converter of Queniat in order to allow for the input of a control signal from a digital controller (Queniat, col.4 lines 57-65) in place of a fixed reference voltage based on Fukushima's fig.1 Vref value, as well as the integrator coupled to the thermistor/resistor output in order to use a cumulative feedback value rather than instantaneous (Killian, col.3 lines 54-58) avoiding unnecessarily large swings in value (thus the given circuit placement limitations would be met as the DAC output would be coupled to the current gain input through the op-amp, and the integrator output would be coupled to the DAC through the op-amp).

With respect to claim 18, Fukushima further teaches the thermistor to have a negative temperature coefficient (col.3 lines 66-67).

With respect to claim 19, Fukushima, Queniat and Killian do not teach the integrator, DAC, and current gain device to be located on the same chip. It would have been obvious to one of ordinary skill in the art at the time of the invention to combine these elements onto one chip in order to reduce the footprint of the overall circuit as is well known and widely practiced in the art.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tod T. Van Roy whose telephone number is (571)272-8447. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Minsun Harvey can be reached on (571)272-1835. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

TVR

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